DAQ for Run 4

John Haggerty
Brookhaven National Laboratory

Major Changes for Run 4

These big changes:

- Objectivity replaced by PostgreSQL
- Multievent buffering in all systems set to 3
- EvB expanded, ATM replaced by Gigabit Ethernet
- RH7.2 replaced by RH8 ala RCF
- No Steve Adler

imply a host of smaller ones.

PostgreSQL

- There isn't quite as much to change online as offline, but there's enough:
  - GL1 configuration—Sergei Belikov has essentially done this, some tuning
  - GL1/L2 configuration recording
  - Still up in the air:
    - Logbook relation to database
    - "Run control" database
- Martin is setting up machines for the database in 1008
- Irina will help get them set up "just so"

Multievent Buffering Status

- The last FEM multievent buffering problem appears to have been solved by Miljko Bobrek in the PC FPGA code. We should run some more tests, but it ran reliably and Anders examined the pulser data and found it ok. Hopefully, no surprises.
- The old EMCAL code seemed to work ok, but we could shave the ENDAT times and move to something like the ultimate data format if we switch to Miljko's new code. Most things work, but we need to run it more thoroughly with an eye to operational needs. Soon.
- We also should do an all-system test again soon to make sure there are no other surprises (DAQ Challenge, maybe).

EvB

Discussed in talk by Brian Cole

Run Control

There will be many changes to accommodate changes to the EvB and database (multievent buffering is pretty transparent). This is being handled with contributions from the whole ONCS group, with Ed and Chris supervising the build and structure right now. First challenge is to get it all to work in RH8; close, I think.

I'm not a fan of new features; I think it's better to keep it lean, make it fast to start up, and keep modular things separate. Some of that is happening; we are pondering whether we can eliminate the "GL1 rc" by integrating it into the EvBServer. That would save several initializations at startup.

Other Changes

- FEM's come and go: NTC, FCAL, MVD, and Aerogel are in play
- New GTM's built, awaiting testing
- We're trying to replace the PPG with a *much* simpler device
- Two new bufferboxes (phnxbox6 and phnxbox7) each with 2 1 Tbyte filesystems purchased and installed by Martin

Speed

- I did some speed tests on granules that I could: http://www.phenix.bnl.gov/~haggerty/tn/speed-1.0/speed.pdf
- My conclusion was that individual granules can push data into an SEB at around 5-6 kHz
- Of course, your mileage may vary—this only wrote data to a local SEB disk (thanks, Martin) so there was no network activity, no routing events, one DCMGROUP at a time, so no scaling effects
- All those things potentially make it slower
- We need to get back and study Brian's observation (Sergei and I confirmed it) that when we read out the LL1's, the GL1 doesn't go faster than 3.5 kHz

DAQ Challenge

MUID has requested a cosmic ray run which is now scheduled for the week of November 3. By then, the EC should be rolled in and it should be possible to run most of the detector.

That's a good target for Run 4 readiness: in 3-4 weeks, try to run a large part of the detector with as much of the shiny new DAQ as possible and see how fast it runs. If you are squeamish about the DAQ group running your detector, please try to be present.

This will take a major push by the DAQ group to get up and running, and there will be difficulties and limitations, but it's a good first step to figure out what to expect in Run 4.

But shifts start only three weeks after this test run… ready or not.

The Month Ahead

- Lots to do… lots of interruptions
- Aerogel still a major factor in working in 1008 (interruptions to water and power to permit installation)
- Safety system checkout will cause further interruptions
- In about two months, we're supposed to have the system back together and running….